In[1]:=
```
RR[n_, x_] := NIntegrate[Sin[x Sin[α] - n α], {α, 0, π}] / π;
```

In[8]:=
```
qu[n_, x_] := BesselJ[n, x] / RR[n, x]
qu2[n_, x_] := RR[n, x] / BesselJ[n, x];
```

In[35]:=
```
Table[Simplify[Integrate[Sin[x Sin[α] - n α], {α, 0, π}], x > 0], {n, 5, 12}] // MatrixForm
```

Out[35]//MatrixForm=

$$\begin{pmatrix}
\frac{80}{3}\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{1}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]-\frac{256}{15}\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{1}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]-5\pi\,\text{StruveH}[-1,x] \\
-24\,x\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{3}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]+\frac{256}{5}\,x\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{3}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]-\frac{1024}{35}\,x\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{3}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]+\pi\,\text{StruveH}[0,x] \\
\frac{224}{3}\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{1}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]-\frac{1792}{15}\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{1}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]+\frac{2048}{35}\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{1}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]-7\pi\,\text{StruveH}[-1,x] \\
-\frac{128}{3}\,x\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{3}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]+\frac{512}{3}\,x\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{3}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]-\frac{8192}{35}\,x\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{3}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]+\frac{32768}{315}\,x\,\text{HypergeometricPFQ}\left[\{5\},\left\{\frac{3}{2},\frac{11}{2}\right\}, \\
160\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{1}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]-\frac{2304}{5}\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{1}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]+\frac{18432}{35}\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{1}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]-\frac{65536}{315}\,\text{HypergeometricPFQ}\left[\{5\},\left\{\frac{1}{2},\frac{11}{2}\right\},-\frac{x^2}{4}\right]- \\
-\frac{200}{3}\,x\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{3}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]+\frac{1280}{3}\,x\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{3}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]-1024\,x\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{3}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]+\frac{65536}{63}\,x\,\text{HypergeometricPFQ}\left[\{5\},\left\{\frac{3}{2},\frac{11}{2}\right\}, \\
\frac{880}{3}\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{1}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]-\frac{19712}{15}\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{1}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]+\frac{90112}{35}\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{1}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]-\frac{720896}{315}\,\text{HypergeometricPFQ}\left[\{5\},\left\{\frac{1}{2},\frac{11}{2}\right\},-\frac{x^2}{4}\right] \\
-96\,x\,\text{HypergeometricPFQ}\left[\{2\},\left\{\frac{3}{2},\frac{5}{2}\right\},-\frac{x^2}{4}\right]+896\,x\,\text{HypergeometricPFQ}\left[\{3\},\left\{\frac{3}{2},\frac{7}{2}\right\},-\frac{x^2}{4}\right]-\frac{16384}{5}\,x\,\text{HypergeometricPFQ}\left[\{4\},\left\{\frac{3}{2},\frac{9}{2}\right\},-\frac{x^2}{4}\right]+\frac{196608}{35}\,x\,\text{HypergeometricPFQ}\left[\{5\},\left\{\frac{3}{2},\frac{11}{2}\right\},
\end{pmatrix}$$

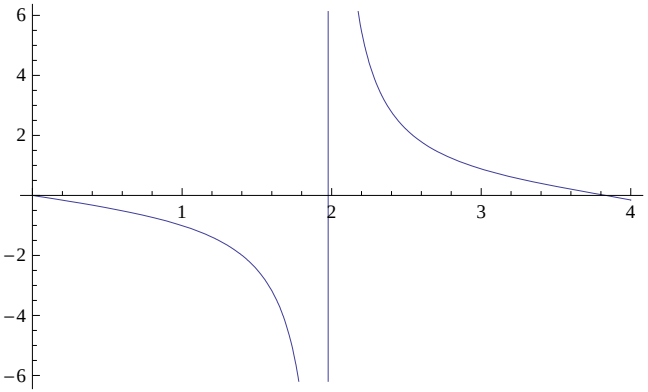
In[24]:=
```
Power[2, 4]
```

Out[24]= 16

```
hipo[n_, x_] := Power[-1, n] * π * StruveH[-n, x] +
```

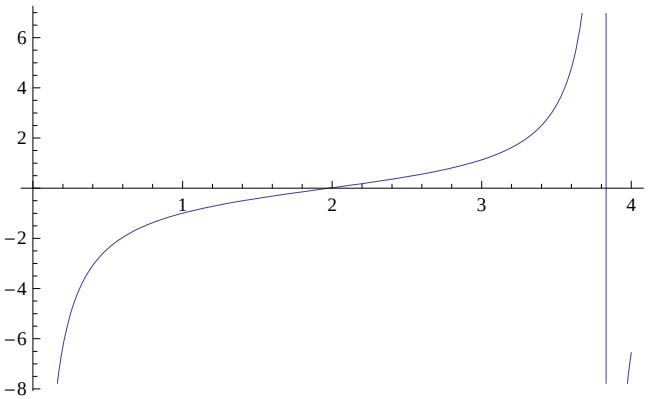
In[7]:=
```
Plot[qu[1, x], {x, 0, 4}]
```

Out[7]=



In[10]:=
```
Plot[qu2[1, x], {x, 0, 4}]
```

Out[10]=



In[12]:=
```
Plot[{RR[1, x], BesselJ[1, x]}, {x, 0, 10}]
```

Out[12]=